

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 82**

**[OAR-2003-0118; FRL-xxxx-x]**

**RIN 2060-AG12**

**Protection of Stratospheric Ozone: Notice 19 for Significant New Alternatives Policy Program**

**AGENCY:** Environmental Protection Agency.

**ACTION:** Notice of Acceptability.

**SUMMARY:** This Notice of Acceptability expands the list of acceptable substitutes for ozone-depleting substances (ODS) under the U.S. Environmental Protection Agency's (EPA) Significant New Alternatives Policy (SNAP) program. The substitutes are for use in the following sectors: refrigeration and air conditioning, foam blowing, fire suppression and explosion protection, and sterilants. This document also clarifies the status of the use of a hydrochlorofluorocarbon as an aerosol solvent, revises the global warming potential for a substitute previously listed as acceptable for use in fire suppression and explosion protection based on new information, and clarifies a statement from the previous SNAP notice of acceptability of August 21, 2003 regarding a refrigerant.

**EFFECTIVE DATE:** [Insert Federal Register publication date].

**ADDRESSES:** EPA has established a docket for this action under Docket ID No. OAR-2003-0118 (continuation of Air Docket A-91-42). All electronic documents in the docket are listed in the EDOCKET index at <http://www.epa.gov/edocket>. Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted

by statute. Publicly available docket materials are available either electronically in EDOCKET or in hard copy at the EPA Air Docket (No. A-91-42), EPA/DC, EPA West, Room B102, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

**FOR FURTHER INFORMATION CONTACT:** Margaret Sheppard by telephone at (202) 343-9163, by facsimile at (202) 343-2338, by e-mail at [sheppard.margaret@epa.gov](mailto:sheppard.margaret@epa.gov), or by mail at U.S. Environmental Protection Agency, Mail Code 6205J, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Overnight or courier deliveries should be sent to the office location at 1310 L Street, N.W., 8<sup>th</sup> floor, Washington, D.C., 20005.

For more information on the Agency's process for administering the SNAP program or criteria for evaluation of substitutes, refer to the original SNAP rulemaking published in the Federal Register on March 18, 1994 (59 FR 13044). Notices and rulemakings under the SNAP program, as well as other EPA publications on protection of stratospheric ozone, are available from EPA's Ozone Depletion World Wide Web site at <http://www.epa.gov/ozone/> including the SNAP portion at <http://www.epa.gov/ozone/snap/>.

**SUPPLEMENTARY INFORMATION:**

- I. Listing of New Acceptable Substitutes
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  - B. Foam Blowing
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- D. Sterilants
- II. Clarification of Status of HCFC-142b in Aerosols under SNAP
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Appendix A – Summary of Acceptable Substitutes

Appendix B – New Information Available

## **I. Listing of New Acceptable Substitutes**

This section presents EPA's most recent acceptable listing decisions for substitutes in the following industrial sectors: refrigeration and air conditioning, foam blowing, fire suppression and explosion protection, and sterilants. For copies of the full list of SNAP decisions in all industrial sectors, visit EPA's Ozone Depletion web site at <http://www.epa.gov/ozone/snap/lists/index.html>.

The sections below discuss each substitute listing in detail. Appendix A contains a table summarizing today's listing decisions for new substitutes. The statements in the "Further Information" column in the table provide additional information, but are not legally binding under section 612 of the Clean Air Act. In addition, the "further information" may not be a comprehensive list of other legal obligations you may need to meet when using the substitute. Although you are not required to follow recommendations in the "further information" column of the table to use a substitute, EPA strongly encourages you to apply the information when

using these substitutes. In many instances, the information simply refers to standard operating practices in existing industry and/or building-code standards. Thus, many of these statements, if adopted, would not require significant changes to existing operating practices.

Submissions to EPA for the use of the substitutes listed in this document may be found under category VI-D of EPA air docket A-91-42 at the address described above under “ADDRESSES.” You can find other materials supporting the decisions in this action under category IX-B of EPA docket A-91-42 and in e-docket OAR-2003-0118 at <http://www.epa.gov/edocket/> .

#### *A. Refrigeration and Air Conditioning*

##### *1. ISCEON 79*

*EPA’s decision:*

*ISCEON 79 [R-125/134a/600a (85.1/11.5/3.4)] is acceptable for use in new and retrofit equipment as a substitute for R-502, HCFC-22, and other HCFC blends including but not limited to R-401A, R-401B, R-402A, R-402B, R-406A, R-408A, R-409A, R-411A, R-411B, R-411C, R-414A, R-414B and R-416A in:*

- industrial process refrigeration
- retail food refrigeration
- cold storage warehouses
- refrigerated transport
- commercial ice machines
- ice skating rinks
- household refrigerators and freezers

ISCEON 79 is a blend of 85.1% by weight HFC-125 (pentafluoroethane, Chemical Abstracts Service Registry Number (CAS ID #) 354-33-6), 11.5% by weight HFC-134a (1,1,1,2-tetrafluoroethane, CAS ID #811-97-2), and 3.4% by weight HC-600a (isobutane, 2-methylpropane, CAS ID #75-28-5). You may find the submission under EPA Air Docket A-91-42, item VI-D-302 (or see e-docket OAR-2003-0118).

*Environmental information:*

The ozone depletion potential (ODP) of ISCEON 79 is zero. The Global Warming Potentials (GWPs) of HFC-125 and HFC-134a are 3450 and 1320, respectively (relative to carbon dioxide, using a 100-year time horizon (United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO) *Scientific Assessment of Ozone Depletion: 2002*).) The atmospheric lifetimes of these constituents are 29 and 14.0 years, respectively.

HFC-125 and HFC-134a are excluded from the definition of volatile organic compound (VOC) under Clean Air Act regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s).

*Flammability information:*

While isobutane is flammable, the blend as formulated and under worst case fractionated formulation scenarios is not flammable.

*Toxicity and exposure data:*

HFC-125 and HFC-134a have 8 hour/day, 40 hour/week workplace environmental exposure limits (WEELs) of 1000 ppm established by the American Industrial Hygiene Association (AIHA). Isobutane has a 10 hour/day, 40 hour/week recommended exposure limit

(REL) established by the National Institute for Occupational Safety and Health (NIOSH) of 800 ppm. EPA expects users to follow all recommendations specified in the Material Safety Data Sheet (MSDS) for the blend and the individual components and other safety precautions common in the refrigeration and air conditioning industry. We also expect that users of ISCEON 79 will adhere to the AIHA's WEELs and the ACGIH's TLV and other specified exposure limits.

#### *Comparison to other refrigerants*

ISCEON 79 is not an ozone depleter; thus, it poses a lower risk for ozone depletion than R-502, a blend of HCFC-22 and CFC-115; HCFC-22; and HCFC blends, the ODSs ISCEON 79 replaces. ISCEON 79 has a comparable or lower GWP than most other common substitutes for R-502, HCFC-22, and HCFC blends. Flammability and toxicity risks are low, as discussed above. Thus, we find that ISCEON 79 is acceptable because there are no other substitutes that are currently or potentially available and that provide a substantially lower risk to public health and the environment in the end uses listed.

#### 2. R-420A

##### *EPA's decision:*

*R-420A is acceptable for use in new and retrofit equipment as a substitute for R-500 and CFC-12 in:*

- retail food refrigeration
- cold storage warehouses
- commercial ice machines
- ice skating rinks

- water coolers
- vending machines
- residential dehumidifiers
- industrial process refrigeration
- industrial process air conditioning
- reciprocating chillers
- screw chillers
- centrifugal chillers
- household refrigerators and freezers

R-420A is a blend of 88% by weight HFC-134a (1,1,1,2-tetrafluoroethane, CAS ID #811-97-2), and 12% by weight HCFC-142b (1-chloro-1,1-difluoroethane, CAS ID #75-68-3).

A common trade name for this refrigerant blend is Choice refrigerant. You may find the submission under EPA Air Docket A-91-42, item VI-D-302 (or see e-docket OAR-2003-0118).

*Environmental information:*

The ozone depletion potential (ODP) of HCFC-142b is 0.065 and HFC-134a has an ODP of zero. The GWPs of HCFC-142b and HFC-134a are 2400 and 1320, respectively (relative to carbon dioxide, using a 100-year time horizon (United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO) *Scientific Assessment of Ozone Depletion: 2002*).) The atmospheric lifetimes of these constituents are 17.9 and 14.0 years, respectively.

Because R-420A contains an ODS, regulations on its use apply, including the requirements for technician certification, mandatory recovery of refrigerant during service of

equipment containing R-420A, a requirement that sales of the refrigerants be made only to EPA-certified technicians, and the statutory prohibition under §608(c) of the Clean Air Act against knowingly venting refrigerants. Production of HCFC-142b will be subject to further control beginning in 2010, so blends containing HCFC-142b such as R-420A are only transitional substitutes.

HCFC-142b and HFC-134a are excluded from the definition of volatile organic compound (VOC) under Clean Air Act regulations addressing the development of SIPs to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s).

*Flammability information:*

Although HCFC-142b is moderately flammable, the blend is not flammable as formulated or under worst case fractionated formulation scenarios.

*Toxicity and exposure data:*

HCFC-142b and HFC-134a have 8 hour/day, 40 hour/week WEELs of 1000 ppm established by the AIHA. EPA expects users to follow all recommendations specified in the MSDS for the blend and the individual components and other safety precautions common in the refrigeration and air conditioning industry. We also expect that users of R-420A will adhere to the AIHA's WEELs.

*Comparison to other refrigerants:*

R-420A has a lower ODP than the Class I ODSs it replaces, CFC-12 or R-500, a blend containing CFC-12. R-420A has a comparable GWP to that of most other substitutes for R-500 and CFC-12. Flammability and toxicity risks are low, as discussed above. Thus, we find that R-420A is acceptable as a substitute for Class I ODS in the end uses listed.



### 3. HFC-134a

#### *EPA's decision:*

*HFC-134a is acceptable for use in new and retrofit equipment as a substitute for HCFC-22 in motor vehicle air conditioning for buses and passenger trains.*

HFC-134a is also known as 1,1,1,2-tetrafluoroethane (CAS ID# 811-97-2).

#### *Environmental information:*

See the decision above in section I.A.1 for ISCEON 79 for environmental information about HFC-134a.

#### *Toxicity and exposure data:*

See the decision above in section I.A.1 for ISCEON 79 for toxicity and exposure data about HFC-134a.

#### *Flammability information:*

HFC-134a is non-flammable.

#### *Comparison to other refrigerants.*

HFC-134a has no ozone depletion potential and thus, poses a lower risk in ozone depletion than HCFC-22, the ODS it replaces. HFC-134a has a comparable or lower GWP than HCFC-22 and blends previously found acceptable as a substitute for HCFC-22 in bus air conditioning. Flammability and toxicity risks are low, as discussed above. Therefore, we find HFC-134a acceptable in motor vehicle air conditioning for buses and passenger trains.

### 4. R-407C

#### *EPA's decision:*

*R-407C is acceptable for use in new and retrofit equipment as a substitute for HCFC-22 in*

*motor vehicle air conditioning for buses and passenger trains.*

R-407C is a blend of 23% by weight HFC-32 (difluoromethane, CAS ID # 75-10-5), 25% by weight HFC-125 (pentafluoroethane, CAS ID #354-33-6) and 52% by weight HFC-134a (1,1,1,2-tetrafluoroethane, CAS ID #811-97-2).

EPA previously listed R-407C as an acceptable alternative for HCFC-22 and CFCs (February 8, 1996; 61 FR 4736), for HCFC blends (December 20,2002; 67 FR 777927), and for R-502 (August 21, 2003; 68 FR 50533) in various end uses for refrigeration and air conditioning.

*Environmental information:*

The ODP of R-407C is zero. The GWPs of HFC-125, HFC-32 and HFC-134a are 3450, 543, and 1320, respectively (relative to carbon dioxide, using a 100-year time horizon). HFC-32 is the only component of this blend that is a VOC under Clean Air Act regulations.

*Flammability information:*

While HFC-32 is moderately flammable, the blend is not flammable as formulated or under worst case fractionated formulation scenarios.

*Toxicity and exposure data:*

All components of the blend have WEELs of 1000 ppm established by the AIHA. EPA expects users to follow all recommendations specified in the MSDS for the blend and the individual components and other safety precautions common in the refrigeration and air conditioning industry. We also expect that users of R-407C will adhere to the AIHA's WEELs.

*Comparison to other refrigerants:*

R-407C is not an ozone depleter; thus, it reduces risk from ozone depletion compared to HCFC-22 and blends containing HCFCs. R-407C has a comparable or lower GWP than that for

HCFC-22 and blends previously found acceptable as a substitute for HCFC-22 in bus air conditioners. Flammability and toxicity risks are low, as discussed above. Thus, we find that R-407C is acceptable because it reduces overall risk to public health and the environment in motor vehicle air conditioning in buses and passenger trains.

## 5. R-410A

### *EPA's decision:*

*R-410A is acceptable for use in new equipment as a substitute for HCFC-22 in motor vehicle air conditioning for buses and passenger trains.*

R-410A is a blend of 50% by weight HFC-32 (difluoromethane) and 50% by weight HFC-125 (pentafluoroethane). Due to the high operating pressures typical of R-410A systems, this blend is acceptable only in new equipment and not in retrofit equipment.

EPA previously listed R-410A as an acceptable alternative for HCFC-22 and CFCs (February 8, 1996; 61 FR 4736) and for HCFC blends (December 20, 2002; 67 FR 77927) in various end uses for refrigeration and air conditioning.

### *Environmental information:*

The ODP of R-410A is zero. For environmental information about HFC-125, see section I.A.1 above for ISCEON 79; for environmental information about HFC-32, see section I.A.5 above for R-407C.

### *Flammability information:*

While HFC-32 is moderately flammable, the blend is not flammable.

### *Toxicity and exposure data:*

For toxicity and exposure data on HFC-125 and HFC-32, see section I.A.5 above for R-

407C. We expect that users of R-410A will adhere to the AIHA's WEELs.

*Comparison to other refrigerants:*

R-410A is not an ozone depleter; thus, it reduces risk from ozone depletion compared to HCFC-22 and blends previously found acceptable as a substitute for HCFC-22 in bus air conditioners. Flammability and toxicity risks are low, as discussed above. Thus, we find that R-410A is acceptable because it reduces overall risk to public health and the environment in motor vehicle air conditioning in buses and passenger trains.

*B. Foam Blowing*

*1. Ecomate™*

*EPA's decision:*

*Ecomate™ is acceptable as a substitute for CFCs and HCFCs in polyurethane spray foam.*

This decision corresponds with the SNAP decision published in Notice 18, August 21, 2003 (68 FR 50533) for other foam blowing end-uses.

The submitter, Foam Supplies, claims that the composition of Ecomate™ is confidential business information (see docket A-91-42, item VI-D-296 or see e-docket OAR-2003-0118).

*Environmental information:*

Ecomate™ has no ODP and very low or zero global warming potential (GWP). Users should be aware that Ecomate™ is not excluded from the definition of volatile organic compound (VOC) under Clean Air Act regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s). For more information refer to the manufacturer of Ecomate™, EPA regulations, and your state or local air quality agency. Also, because Ecomate™ is considered hazardous, spills and disposal

should be handled in accordance with requirements of the Resource Conservation and Recovery Act (RCRA).

*Flammability information:*

Ecomate™ is flammable and should be handled with proper precautions. Use of Ecomate™ will require safe handling and shipping as prescribed by the Occupational Safety and Health Administration (OSHA) and the Department of Transportation (for example, using personal safety equipment and following requirements for shipping hazardous materials at 49 CFR parts 170 through 173). However, when blended with fire retardant, the flammability of Ecomate™ can be reduced to make a formulation that is either combustible or non-flammable (refer to the manufacturer of Ecomate™ for more information). The manufacturer of Ecomate™ has prepared for safety training for use of this flammable blowing agent in spray foam (see docket A-91-42, item VI-D-307 or e-docket OAR-2003-0118).

*Toxicity and exposure data:*

Ecomate™ should be handled with proper precautions. EPA anticipates that Ecomate™ will be used consistent with the recommendations specified in the manufacturers' Material Safety Data Sheets (MSDSs). OSHA established a permissible exposure limit for the main component of Ecomate™ of 100 ppm for a time-weighted average over an eight-hour work shift.

*Comparison to other foam blowing agents:*

Ecomate™ is not an ozone depleter; thus, it reduces risk overall compared to the ODS it replaces. Ecomate™ has a comparable or lower GWP than the other substitutes for CFCs and HCFCs in these end uses. Although Ecomate™ is flammable, we find that the manufacturer's recommended precautions for safety are sufficient so that the risks will not be significantly higher than for other available or potentially available substitutes in this end use. Meeting federal exposure requirements allows Ecomate™ to be used with no greater risk of toxicity than for other available or potentially available substitutes in this end use. Thus, we find that Ecomate™ is

acceptable because there are no other substitutes that are currently or potentially available and that provide a substantially lower risk to public health and the environment in polyurethane spray foam.

### *C. Fire Suppression and Explosion Protection*

#### 1. HFC-227ea with 0.15% *d*-limonene (NAF S 227)

##### *EPA's decision:*

*NAF S 227 is acceptable for use as a substitute for halon 1301 in the total flooding end use in both normally occupied and unoccupied spaces.*

NAF S 227 is a mixture of HFC-227ea, also known as 1,1,1,2,3,3,3-heptafluoropropane, (CAS ID# 431-89-0), and 0.15% *d*-limonene, also known as 4-isopropenyl-1-methycyclohexene (CAS ID# 5989-27-5), by weight. You may find the submission under Docket A-91-42, item VI-D-305 (or see e-docket OAR-2003-0118).

EPA's decision is that NAF S 227 is acceptable for use as a substitute for halon 1301 in the total flooding end use in both normally occupied and unoccupied spaces. EPA finds the blend acceptable as submitted; however, blends containing more than 0.15% *d*-limonene are not addressed by today's decision. EPA previously found HFC-227ea acceptable in total flooding (January 29, 2002; 67 FR 4185). This decision is similar to the SNAP decision published in Notice 18, August 21, 2003 (68 FR 50533) concerning HFC-125 with 0.15% *d*-limonene (NAF S 125).

##### *Environmental information:*

Both of the components of NAF S 227 have an ozone depletion potential of zero. HFC-227ea has a global warming potential (GWP) of 3660 and *d*-limonene has a GWP of 10. These values are lower than the GWP of Halon 1301 (6900).

HFC-227ea is currently defined as a VOC, although EPA has proposed that it be excluded from the definition of volatile organic compound (VOC) under Clean Air Act regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards (September 3, 2003; 68 FR 52373). 40 CFR 51.100(s). *d*-limonene is a VOC.

*Flammability:*

Although *d*-limonene is flammable, the blend is non-flammable.

*Toxicity and exposure data:*

As with other fire suppressants, EPA recommends that you minimize exposure to this agent. If personnel are exposed to the agent, they should exit the area within five minutes or less. EPA recommends that unnecessary exposure to fire suppression agents and their decomposition products be avoided and that personnel exposure be limited to no more than 5 minutes. This minimizes the risk of effects on the heart (irregular heartbeats) from HFC-227ea and other halocarbons.

In order to keep exposure levels as low as possible, EPA recommends the following for establishments installing and maintaining total flooding systems:

- Put adequate ventilation in place. If ventilation is suspected to be inadequate, self-contained breathing apparatus (SCBA) should be available;
- Wear proper personal protection equipment (impervious butyl gloves, eye protection, chemical resistant aprons, long sleeves, and safety shoes);
- Clean up all spills immediately in accordance with good industrial hygiene practices; and
- Provide training for safe handling procedures to all employees that would be likely to handle the containers of NAF S 227 or extinguishing units filled with the material.

Use of this agent should conform with relevant Occupational Safety and Health

Administration (OSHA) requirements, including 29 CFR part 1910, subpart L, Sec. 1910.160 for fixed fire extinguishing systems, Sec. 1910.162 for gaseous agents and Sec. 1910.165 for predischage employee alarms. Per OSHA requirements, protective gear (SCBA) should be available in the event that personnel reenter the area. In addition, users should also observe the guidelines in the latest edition of the National Fire Protection Association (NFPA) 2001 Standard on Clean Agent Fire Extinguishing Systems for use of HFC-227ea.

*Comparison to other fire suppressants.*

NAF S 227 has no ODP; thus, it reduces risk overall compared to halon 1301, the ODS it replaces. EPA has already found acceptable HFC-227ea, the main ingredient in NAF S 227. The components of NAF S 227 have a GWP comparable with or lower than that of many other acceptable substitutes for halon 1301. Thus, we find that NAF S 227 is acceptable because it does not present a greater risk to public health and the environment in the end use listed than other substitutes that are available.

#### D. *Sterilants*

##### 1.-3. IoGas™ Sterilant Blends 1, 3, and 6

*EPA's decision:*

*IoGas™ 1 Sterilant, IoGas™ 3 Sterilant, and IoGas™ 6 Sterilant are acceptable as substitutes for CFC-12, HCFC-22, HCFC-124, and blends thereof in ethylene oxide blends for sterilization.*

The IoGas™ Sterilant Blends are all blends of ethylene oxide, carbon dioxide (CO<sub>2</sub>), and trifluoriodomethane (CF<sub>3</sub>I). CF<sub>3</sub>I, CAS ID #2314-97-8, is also called FIC-131I or trifluoromethyl iodide. EPA previously found ethylene oxide alone and blends of CO<sub>2</sub> and ethylene oxide acceptable as substitutes for CFC-12 in blends with ethylene oxide (59 FR13044, March 18, 1994). You may find the submission under EPA Air Docket A-91-42 item VI-D-304 or see e-docket OAR-2003-0118.



*Environmental information:*

The ozone depletion potential (ODP) of CF<sub>3</sub>I is less than 0.0025, and ethylene oxide and CO<sub>2</sub> have an ODP of zero. The Global Warming Potentials (GWPs) of CF<sub>3</sub>I and CO<sub>2</sub> are less than 1 and 1 respectively (relative to carbon dioxide, using a 100-year time horizon (United Nations Environment Programme (UNEP) and World Meteorological Organization (WMO) *Scientific Assessment of Ozone Depletion: 2002*)). The atmospheric lifetime of CF<sub>3</sub>I is approximately 0.007 years.

CF<sub>3</sub>I and ethylene oxide are volatile organic compounds (VOCs). CO<sub>2</sub> is excluded from the definition of VOC under Clean Air Act regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s).

Ethylene oxide is a hazardous air pollutant under Section 112 of the Clean Air Act. A National Emission Standard for Hazardous Air Pollutants applies to commercial sterilization and fumigation operations (40 CFR part 63, subpart O).

*Flammability information:*

Although ethylene oxide is flammable, the blends as formulated are not flammable.

*Toxicity and exposure data:*

Ethylene oxide has a permissible exposure limit (PEL) of 1 ppm on an 8-hour time-weighted average from the Occupational Safety and Health Administration (OSHA). EPA recommends an acceptable exposure limit of 150 ppm on an 8-hour time-weighted average for CF<sub>3</sub>I, with an exposure ceiling of no more than 2,000 ppm. EPA expects users to follow all recommendations specified in the Material Safety Data Sheet (MSDS) for the blend and the

individual components and other safety precautions common in the medical sterilization industry. We also expect that users of IoGas™ Sterilant Blends will adhere to EPA's recommended exposure limit.

*Comparison to other sterilants:*

IoGas™ Sterilant Blends 1, 3, and 6 have an ODP of less than 0.001; thus, they pose a lower risk for ozone depletion than CFC-12, HCFC-22, or HCFC-124, the ODSs they replace. IoGas™ Sterilant Blends 1, 3, and 6 have a comparable or lower GWP than most other substitutes for CFC-12, HCFC-22, or HCFC-124. Flammability risks are low, as discussed above. The toxicity of the sterilant blends is less than that of ethylene oxide alone, which is also an acceptable substitute. Thus, we find IoGas™ Sterilant Blends 1, 3, and 6 acceptable because there are no other substitutes that are currently or potentially available and that provide a substantially lower risk to public health and the environment in the end uses listed.

## **II. Clarification of Status of HCFC-142b in Aerosols under SNAP**

Some individuals have inquired whether HCFC-142b may be sold in aerosol products as a substitute for HCFC-141b, particularly as a solvent to assist in mold release of plastics. Substitutes for ozone-depleting substances are required to be submitted to the SNAP program for review before they may be sold, with minor exceptions (see 40 CFR 82.174(a) and 82.176; Clean Air Act section 612(e)). No one has submitted information on this substitute in this end use to EPA, and therefore, we conclude that HCFC-142b is not currently legal to sell as an aerosol solvent as a substitute for HCFC-141b or CFC-113. If any manufacturer or distributor is interested in selling such a product, they should complete a submission form for review (available at <http://www.epa.gov/ozone/snap/submit/index.html> ).

### **III. Revised Global Warming Potential of C6-Perfluoroketone Based on New Data**

The Environmental Protection Agency published in the Federal Register of December 20, 2002 (67 FR 77927), a Notice of Acceptability related to the SNAP program. We also published a rule under the SNAP program on fire suppressant alternatives to halon on January 27, 2003 (68 FR 4004). After publication of these documents, EPA received updated information related to the calculation of the environmental impact of C6-perfluoroketone, also known as FK-5-1-12mm<sup>2</sup>, a fire suppression substitute that was listed as an acceptable total flooding agent in the Notice and as an acceptable streaming agent, subject to narrowed use limits, in the rule. Based on this new information, EPA published two correction notices in the Federal Register of April 7, 2003 (68 FR 16728 and 68 FR 16729), listing a GWP for C6-perfluoroketone of between four and seven, relative to CO<sub>2</sub> over a 100-year time horizon. Since then, new information found in the literature was recently made available to EPA. Based on this additional, new information, EPA is correcting the GWP listed for C6-perfluoroketone to between 0.6 and 1.8, relative to CO<sub>2</sub> over a 100-year time horizon. This range includes both the direct GWP and the indirect GWP. The corrected values are also listed in Appendix B of this document.

EPA's evaluation of this new information is available in EPA air docket A-2002-08 at the address described above under ADDRESSES. This correction does not change EPA's finding of acceptability for use of C6-perfluoroketone as a substitute for halon 1301 in total flooding fire suppression applications in both normally occupied and unoccupied areas or our finding that C6-perfluoroketone is acceptable for use as a substitute for halon 1211 as a streaming agent in non-residential areas.

### **IV. Clarification for RS-44**

EPA published a Notice of Acceptability related to the SNAP Program in the Federal Register of August 21, 2003 (68 FR 50533, Notice 18). In FR Doc. 03-75472, published on August 21, 2003, a typographical error was made inadvertently.

EPA decided in that notice of acceptability that RS-44, a refrigerant, is acceptable for use in new and retrofit equipment as a substitute for HCFC-22 in a number of end uses for refrigeration and air conditioning. However, on page 50535 in the first column immediately after the heading, “Comparison to other refrigerants,” the document incorrectly stated that RS-44 was a substitute for CFC-12. Instead, it is a substitute for HCFC-22, as stated elsewhere in that document and in the accompanying table. Therefore, that first sentence in the first column on page 50535 should read as follows:

“RS-44 is not an ozone depleter; thus, it reduces risk from ozone depletion compared to HCFC-22, the ODS it replaces.”

## **V. Section 612 Program**

### *A. Statutory Requirements*

Section 612 of the Clean Air Act authorizes EPA to develop a program for evaluating alternatives to ozone-depleting substances. We refer to this program as the Significant New Alternatives Policy (SNAP) program. The major provisions of section 612 are:

- *Rulemaking* – Section 612(c) requires EPA to promulgate rules making it unlawful to replace any class I (chlorofluorocarbon, halon, carbon tetrachloride, methyl chloroform, and hydrobromofluorocarbon) or class II (hydrochlorofluorocarbon) substance with any substitute that the Administrator determines may present adverse effects to human health or the environment where the Administrator has

identified an alternative that (1) reduces the overall risk to human health and the environment, and (2) is currently or potentially available.

- *Listing of Unacceptable/Acceptable Substitutes* – Section 612 also requires EPA to publish a list of the substitutes unacceptable for specific uses. EPA must publish a corresponding list of acceptable alternatives for specific uses.
- *Petition Process* – Section 612(d) grants the right to any person to petition EPA to add a substance to or delete a substance from the lists published in accordance with section 612(c). The Agency has 90 days to grant or deny a petition. Where the Agency grants the petition, it must publish the revised lists within an additional six months.
- *90-day Notification* – Section 612(e) directs EPA to require any person who produces a chemical substitute for a class I substance to notify the Agency not less than 90 days before new or existing chemicals are introduced into interstate commerce for significant new uses as substitutes for a class I substance. The producer must also provide the Agency with the producer's unpublished health and safety studies on such substitutes.
- *Outreach* – Section 612(b)(1) states that the Administrator shall seek to maximize the use of federal research facilities and resources to assist users of class I and II substances in identifying and developing alternatives to the use of such substances in key commercial applications.
- *Clearinghouse* – Section 612(b)(4) requires the Agency to set up a public clearinghouse of alternative chemicals, product substitutes, and alternative

manufacturing processes that are available for products and manufacturing processes which use class I and II substances.

### *B. Regulatory History*

On March 18, 1994, EPA published the rulemaking (59 FR 13044) which described the process for administering the SNAP program. In the same notice, we issued the first acceptability lists for substitutes in the major industrial use sectors. These sectors include:

- refrigeration and air conditioning;
- foam blowing;
- solvents cleaning;
- fire suppression and explosion protection;
- sterilants;
- aerosols;
- adhesives, coatings and inks; and
- tobacco expansion.

These sectors compose the principal industrial sectors that historically consumed the largest volumes of ozone-depleting compounds.

As described in this original rule for the SNAP program, EPA does not believe that rulemaking procedures are required to list alternatives as acceptable with no limitations. Such listings do not impose any sanction, nor do they remove any prior license to use a substance. Therefore, by this notice we are adding substances to the list of acceptable alternatives without first requesting comment on new listings.

However, we do believe that notice-and-comment rulemaking is required to place any substance on the list of prohibited substitutes, to list a substance as acceptable only under certain conditions, to list substances as acceptable only for certain uses, or to remove a substance from the lists of prohibited or acceptable substitutes. We publish updates to these lists as separate notices of rulemaking in the **Federal Register**.

The Agency defines a "substitute" as any chemical, product substitute, or alternative manufacturing process, whether existing or new, intended for use as a replacement for a class I or class II substance. Anyone who produces a substitute must provide EPA with health and safety studies on the substitute at least 90 days before introducing it into interstate commerce for significant new use as an alternative. This requirement applies to substitute manufacturers, but may include importers, formulators, or end-users, when they are responsible for introducing a substitute into commerce.

You can find a complete chronology of SNAP decisions and the appropriate **Federal Register** citations from the SNAP section of EPA's Ozone Depletion World Wide Web site at [www.epa.gov/ozone/title6/snap/chron.html](http://www.epa.gov/ozone/title6/snap/chron.html). This information is also available from the Air Docket (see **Addresses** section above for contact information).

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**List of Subjects in 40 CFR Part 82**

Environmental protection, Administrative practice and procedure, Air pollution control,  
Reporting and recordkeeping requirements.

Date: \_\_\_\_\_

Brian J. McLean, Director  
Office of Atmospheric Programs  
Office of Air and Radiation



## APPENDIX A: SUMMARY OF ACCEPTABLE DECISIONS

### REFRIGERATION AND AIR CONDITIONING

<b>End-Use</b>	<b>Substitute</b>	<b>Decision</b>	<b>Further Information</b>
Motor vehicle air conditioning for buses and passenger trains (new)	R-410A as a substitute for HCFC-22	Acceptable	
Motor vehicle air conditioning for buses and passenger trains (retrofit and new)	HFC-134a as a substitute for HCFC-22	Acceptable	
	R-407C as a substitute for HCFC-22	Acceptable	
Industrial process refrigeration (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Industrial process air conditioning (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Ice skating rinks (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Cold storage warehouses (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>

End-Use	Substitute	Decision	Further Information
	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Refrigerated transport (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
Retail food refrigeration (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Vending machines (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Water coolers (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Commercial ice machines (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Household refrigerators and freezers (retrofit and new)	ISCEON 79 as a substitute for R-502, HCFC-22 and HCFC blends	Acceptable	See note <sup>1</sup>
	R-420A as a substitute for R-500 and CFC-12	Acceptable	

<b>End-Use</b>	<b>Substitute</b>	<b>Decision</b>	<b>Further Information</b>
Centrifugal chillers (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Reciprocating chillers (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Screw chillers (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	
Residential dehumidifiers (retrofit and new)	R-420A as a substitute for R-500 and CFC-12	Acceptable	

<sup>1</sup>Note: HCFC blends include, but are not limited to, R-401A, R-401B, R-402A, R-402B, R-406A, R-408A, R-409A, R-411A, R-411B, R-411C, R-414A, R-414B, and R-416.

#### FOAM BLOWING

<b>End-Use</b>	<b>Substitute</b>	<b>Decision</b>	<b>Further Information</b>
Rigid polyurethane spray foam	Ecomate as a substitute for CFCs and HCFCs	Acceptable	Use of the agent should be in accordance with the manufacturers' Material Safety Data Sheets (MSDSs)  See note <sup>1</sup>

Note<sup>1</sup>- OSHA established a permissible exposure limit for the main component of Ecomate™ of 100 ppm for a time-weighted average over an eight-hour work shift.

## FIRE SUPPRESSION AND EXPLOSION PROTECTION

End-Use	Substitute	Decision	Further Information
Total flooding	NAF S 227 as a substitute for Halon 1301	Acceptable	<p>Use of the agent should be in accordance with the safety guidelines in the latest edition of the NFPA 2001 Standard for Clean Agent Fire Extinguishing Systems.</p> <p>Extinguisher bottles should be clearly labeled with the potential hazards associated with the use of HFC-227ea and <i>d</i>-limonene, as well as handling procedures to reduce risk resulting from these hazards.</p> <p>See additional notes 1, 2, 3, 4, 5.</p>

Additional notes:

- 1- Should conform with relevant OSHA requirements, including 29 CFR 1910, Subpart L, Sections 1910.160, 1910.161 (dry chemicals and aerosols) and 1910.162 (gaseous agents).
- 2- Per OSHA requirements, protective gear (SCBA) should be available in the event personnel should reenter the area.
- 3- Discharge testing should be strictly limited to that which is essential to meet safety or performance requirements.
- 4- The agent should be recovered from the fire protection system in conjunction with testing or servicing, and recycled for later use or destroyed.
- 5- EPA has no intention of duplicating or displacing OSHA coverage related to the use of personal protective equipment (e.g., respiratory protection), fire protection, hazard communication, worker training or any other occupational safety and health standard with respect to halon substitutes.

## STERILANTS

End-Use	Substitute	Decision	Further Information
Sterilants	IoGas™ Sterilant Blends 1, 3, and 6 as substitutes for CFC-12, HCFC-22, HCFC-124, in sterilant blends with ethylene oxide	Acceptable	

APPENDIX B: NEW INFORMATION AVAILABLE

FIRE SUPPRESSION AND EXPLOSION PROTECTION

End-Use	Substitute	Information Available
Total flooding	C6-perfluoroketone (FK-5-1-12mmy2, CAS Reg. No.756-13-8 )	EPA reviewed three additional papers on C6-perfluoroketone photolysis. The new information recently made available in the literature supports revising the global warming potential of C-6 perfluoroketone to be between 0.6 and 1.8, relative to CO <sub>2</sub> on a 100-year time horizon. See Docket A-91-42, item IX-B-93 or e-docket OAR-2003-0118-0049.
Streaming	C6-perfluoroketone (FK-5-1-12mmy2, CAS Reg. No.756-13-8 )	EPA reviewed three additional papers on C6-perfluoroketone photolysis. The new information recently made available in the literature supports revising the global warming potential of C-6 perfluoroketone to be between 0.6 and 1.8, relative to CO <sub>2</sub> on a 100-year time horizon.  See Docket A-91-42, item IX-B-93 or e-docket OAR-2003-0118-0049.

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